Name: Date:

Polynomial Factoring solution (version 24)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 - 2x + 21 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-2) \pm \sqrt{(-2)^2 - 4(1)(21)}}{2(1)}$$

$$x = \frac{-(-2) \pm \sqrt{4 - 84}}{2(1)}$$

$$x = \frac{2 \pm \sqrt{-80}}{2}$$

$$x = \frac{2 \pm \sqrt{-16 \cdot 5}}{2}$$

$$x = \frac{2 \pm 4\sqrt{5}\, i}{2}$$

$$x = 1 \pm 2\sqrt{5}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $-6 + 3i$ and $-7 + 8i$ in standard form $(a + bi)$.**

Solution

$$(-6 + 3i) \cdot (-7 + 8i)$$

$$42 - 48i - 21i + 24i^2$$

$$42 - 48i - 21i - 24$$

$$42 - 24 - 48i - 21i$$

$$18 - 69i$$

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3. **Write function $f(x) = x^3 + 3x^2 - 16x + 12$ in factored form. I'll give you a hint: one factor is $(x - 1)$.**

Solution

	1	3	-16	12
1		1	4	-12
	1	4	-12	0

$$f(x) = (x-1)(x^2+4x-12)$$

$$f(x) = (x-1)(x-2)(x+6)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x+7)\cdot(x+4)\cdot(x+1)^2$$

Sketch a graph of polynomial $y = p(x)$.